Precalc Warm Up # 2 - 4

1. Solve: $(2a - 1)(a - 1) = 1$

2. Solve: $5 + |3x - 2| < 12$

HW Questions?

1. By using a factorisation process, solve

(a) $x^2 + 10x + 25 = 0$

(c) $3x^2 + 9x = 0$

(e) $(3 - u)(u + 6) = 0$

(g) $3v^2 - 12v + 12 = 0$

(i) $(x + 3)(x + 2) = 12$

2. Without using the quadratic formula, solve

(a) $u + \frac{1}{u} = -2$

(d) $\frac{x}{2} - \frac{1}{x+1} = 0$

$\frac{x}{2} = \frac{1}{x+1}$

cross multiply . . .

3. By completing the square, solve

(a) $x^2 + 2x = 5$

(d) $4x^2 + x = 2$

$\left(\frac{b}{2}\right)^2$

$4\left(x^2 + \frac{x}{4} + \frac{1}{64}\right) = 2\frac{16}{16} + \frac{1}{16}$

$\left(\frac{1}{2}\cdot\frac{1}{4}\right)^2$

$\frac{4\left(x+\frac{1}{8}\right)^2}{4} = \frac{33}{16}\cdot\frac{1}{4}$

$\sqrt{\left(x+\frac{1}{8}\right)^2} = \pm\sqrt{\frac{33}{64}}$

$ax^2 + bx + c$

$x + \frac{1}{8} = \pm\frac{\sqrt{33}}{8}$

$x = -\frac{1}{8} \pm \frac{\sqrt{33}}{8}$

4. Use the quadratic formula to solve

(a) $x^2 - 3x - 7 = 0$

(d) $x^2 = 7x + 2$

(g) $x^2 + 2x - 7 = 0$

(j) $x^2 - 3x + 9 = 0$

(m) $4x^2 = 8x + 9$

$4x^2 - 8x - 9 = 0$ $\quad a=4 \quad b=-8 \quad c=-9$

$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$

$x = \frac{8 \pm \sqrt{64-4(4)(-9)}}{2(4)}$

208
$4 \cdot 52$
$16 \cdot 13$

$x = \frac{8 \pm \sqrt{208}}{8}$

$x = \frac{8 \pm \sqrt{16}\sqrt{13}}{8}$

$x = \frac{8}{8} \pm \frac{4\sqrt{13}}{8}$

$x = 1 \pm \frac{\sqrt{13}}{2}$ or $x = \frac{2 \pm \sqrt{13}}{2}$

5. For what value(s) of p does the equation $x^2 + px + 1 = 0$ have

(a) no real solutions (b) one real solution (c) two real solutions.

$b^2 - 4ac < 0$

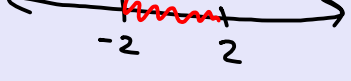
$\sqrt{p^2} < \sqrt{4}$

$|p| < 2$

$-2 < p < 2$

$p^2 < 4$

test -4 $\quad 0 \quad$ 4



$b^2 - 4ac = 0$

$p^2 - 4(1)(1) = 0$

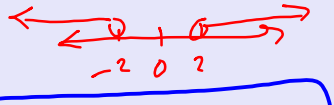
$\sqrt{p^2} = \sqrt{4}$

$p = \pm 2$

$b^2 - 4ac > 0$

$\sqrt{p^2} > \sqrt{4}$

$|p| > 2$



$p < -2$ or $p > 2$

$(-\infty, -2) \cup (2, \infty)$

$a=1 \quad b=2 \quad c=m$

6. Find the values of m for which the quadratic $x^2 + 2x + m = 0$ has

(a) one real solution (b) two real solutions (c) no real solutions.

$b^2 - 4ac = 0$

7. Find the values of m for which the quadratic $x^2 + mx + 2 = 0$ has

(a) one real solution (b) two real solutions (c) no real solutions.

$m^2 - 4(1)(2) = 0$ $\quad > 0 \quad < 0$

$m^2 = 8$

$m = \pm\sqrt{8}$

$\pm 2\sqrt{2}$

8. Find the values of k for which the quadratic $2x^2 + kx + 9 = 0$ has
(a) one real solution (b) two real solutions (c) no real solutions.

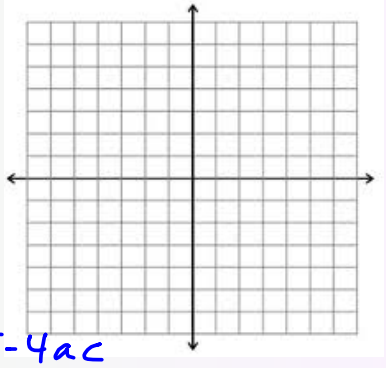
9. Consider the equation $x^2 + 2x = 7$. Prove that this equation has two real roots.

$b^2 - 4ac > 0$

Group worksheet:

Tell what you know about the graph of $y = x^2 - 6x + 5$

How does it open? What is the y-intercept? Name any x-intercepts.



Vertex? (turning point)

What is its Axis of Symmetry?

What is the DISCRIMINANT? $b^2 - 4ac$

What does this tell us about the graph? How many x-intercepts there are.

Put $y = 3x^2 + 12x + 4$ in "turning point form" which is

$$y = a(x-h)^2 + k$$

where (h,k) is the vertex.

$y = 3(x^2 + 4x + 4) + 4 - 12$

$y = 3(x+2)^2 - 8$

What is the vertex? $(-2, -8)$

$y = 3x^2 + 12x + 4$ is in STANDARD FORM.

$y = 3(x + 2)^2 - 8$ is in VERTEX FORM. Vertex is (-2, -8)

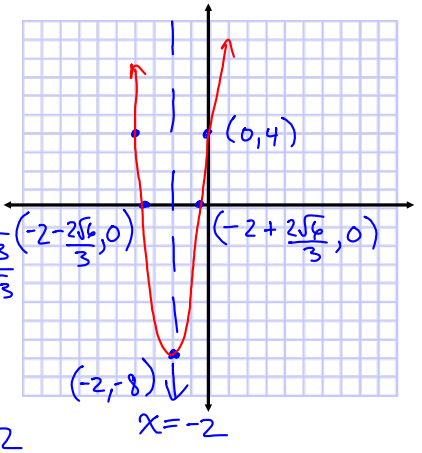
y-intercept? $(0, 4)$

x-intercept? $0 = 3(x+2)^2 - 8$

$\pm\sqrt{\frac{8}{3}} = \sqrt{(x+2)^2}$

$x + 2 = \pm\frac{2\sqrt{2}}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}}$

$x = -2 \pm \frac{2\sqrt{6}}{3}$



Axis of symmetry? $x = -2$

Hence, sketch the graph and label axial intercepts, vertex, and axis of symmetry.

HW: SL book

p. 49 #1a, 2af, 4, 5, 7, 8

Quiz tomorrow: 2.1-2.3